

REMARKS

This is intended as a full and complete Substitute Response to the Office Action dated November 27, 2006. Please accept this Substitute Response to Office Action Dated November 27, 2006 as a substitute for the full and complete response to office action which was filed on February 27, 2007. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1, 3-9, and 11-22 remain pending in the application and are shown above. Claims 1, 3-9, and 11-22 are rejected. Claims 6, 14, and 22 have been cancelled by the Applicants. New claims 23 and 24 have been added. Reconsideration of the rejected claims is requested for reasons presented below.

Claims 1, 9, and 19 are amended to incorporate the subject matter of claims 6, 14, and 22 respectively. Claims 3 and 11 are amended to original scope. Claim 20 has been amended to correct a typographical error. These amendments are not presented to distinguish a reference, thus, the claims as amended are entitled to a full range of equivalents if not previously amended to distinguish a reference.

New claims 23 and 24 have been added to further recite patentable aspects of the invention. It is believed that no new matter has been introduced by these claims. Therefore, Applicants respectfully request entry of new claims 23 and 24.

Claim Rejections Under 35 U.S.C. §103

I. Rejection of Claims 1 & 3-8.

Claims 1, 3-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* (U.S. 6,884,733) in view of *Godet*, Journal of Applied Physics, Vol. 84, 3919, (1998), and *Park et al.* (U.S. Pub. No. 2004/0224241). Claims 3 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* (U.S. Pub. No. 2003/0003771).

Applicants respectfully traverse this rejection based on the grounds that the Examiner has not established a case of prima facie obviousness. The Examiner bears

the initial burden of establishing a *prima facie* case of obviousness. See MPEP § 2142. To establish a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP § 2143. The present rejection fails to establish at least the third element.

Dakshina-Murthy et al. does not teach the use of dual frequency RF for depositing an amorphous carbon layer.

Godet does not teach providing a first frequency between about 10 MHz and about 30 MHz at a power between 200 watts and 800 watts and a second frequency between about 100 KHz and about 500 KHz at a power between about 1 watt and about 200 watts.

Yang et al. and *Park et al.* fail to teach the formation of amorphous carbon using a dual frequency RF.

Dakshina-Murthy et al. in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* either alone or in combination do not teach, show, motivate, or suggest a method for processing a substrate in a processing chamber, comprising, forming a conductive material layer on a surface of the substrate, depositing an amorphous carbon layer on the conductive material layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y , wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz and a second frequency between about 100 KHz and about 500 KHz, etching the amorphous carbon layer to form a patterned amorphous carbon layer, and etching feature definitions in the conductive material layer corresponding to the patterned amorphous carbon layer as recited in independent claim 1 and claims 3-5 and 7-8 dependent thereon.

Thus Applicants submit that independent claim 1 and claims 3-5 and 7-8 depending thereon are patentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park*, in further view of *Yang et al.* either alone or in combination. Accordingly, Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

II. Rejection of Claims 9 and 11-18.

Claims 9, 11-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.* Claim 14 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* Applicants respectfully traverse the rejection.

The arguments discussed above regarding *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* are equally applicable here as none of the references teach using dual frequency RF at the frequency ranges recited in claim 9 to deposit amorphous carbon.

Therefore, *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* either alone or in combination do not teach, show, motivate, or suggest a method for processing a substrate in a chamber, comprising, forming a conductive material layer on a surface of the substrate, depositing an amorphous carbon hardmask on the conductive material layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y , wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz and a second frequency between about 100 KHz and about 500 KHz, depositing an anti-reflective coating on the amorphous carbon hardmask, depositing a patterned resist material on the anti-reflective coating and amorphous carbon hardmask to the conductive material layer, and etching feature definitions in the conductive material layer as recited in claim 9 and claims 9, 11-13, and 15-18 dependent thereon.

Thus Applicants submit that independent claim 9 and claims 11-13, and 15-18 depending therefrom are patentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park*, in further view of *Yang et al.*, either alone or in combination. Accordingly, Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

III. Rejection of Claims 19-22.

Claim 19-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.* Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* Applicants respectfully traverse the rejection.

The arguments discussed above regarding *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* are equally applicable here as none of the references teach using dual frequency RF at the frequency ranges recited in claim 19 to deposit amorphous carbon.

Therefore, *Dakshina-Murthy et al.* in view of *Godet*, and *Park et al.*, in further view of *Yang et al.* either alone or in combination do not teach, show, motivate, or suggest a method for processing a substrate in a chamber, comprising, forming an aluminum containing layer on a surface of the substrate, depositing an amorphous carbon hardmask on the aluminum containing layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y , wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz at a power between 200 watts and 800 watts and a second frequency between about 100 KHz and about 500 KHz at a power between about 1 watt and about 200 watts, depositing an anti-reflective coating on the amorphous carbon hardmask, wherein the anti-reflective coating is a material selected from the group of silicon nitride, silicon carbide, carbon-doped silicon oxide, amorphous carbon, and combinations thereof, depositing a

patterned resist material on the anti-reflective coating, etching the anti-reflective coating and amorphous carbon hardmask to the aluminum-containing layer, removing the resist material, etching feature definitions in the aluminum containing layer at an etch selectivity of amorphous carbon to the aluminum-containing layer at an etch selectivity of amorphous carbon to the aluminum-containing between about 1:3 and about 1:10, and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas or an oxygen containing gas as recited in claim 19 and claims 20-21 dependent thereon.

Thus Applicants submit that independent claim 19 and claims 20-21 depending therefrom are patentable over *Dakshina-Murthy et al.* in view of *Godet*, and *Park*, in further view of *Yang et al.*, alone or in combination. Accordingly, Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

New Claims 23 & 24

Applicants have added new claims 23 and 24 to claim additional aspects of the invention. Applicants submit that new claim 23 is patentable for the reasons discussed above with respect to independent claim 1. Applicants further submit that new claim 24 is patentable for the reasons discussed above with respect to independent claim 9. Applicants respectfully request entrance and allowance of new claims 23 and 24.

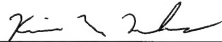
Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, Applicants believe that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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